Indonesia

Local Road Development Project (II)

Report Date ：October 2002

Field Survey ：July 2001

1. Project Profile and Japan's ODA Loan

Project Location Map

Project Site

1.1 Background

Development of local roads was one of the most important issues in the Indonesian Government's Fourth National Five Year Development Plan (1984-1988) (Repelita IV), due to their role in the economic growth and stabilization of the whole nation, as well as in the infrastructure development in rural areas. The JBIC financed a project for the development of local roads (Phase I) in 7 provinces. The average rate for asphalt pavement in the provinces covered by this project (Phase II) was 12.3%, half the average for all provinces, 23.6%, at the time of project appraisal in 1987. In the provinces covered by this project (Phase II), 34.7% of all road surfaces were in "good" condition, less than the average for all provinces, 43.5%. These conditions demonstrated the necessity of this project.

1.2 Objectives

To improve selected local roads in 38 Kabupatens in 10 provinces.[1)]

- To enhance economic development in rural areas
- To provide better mobility to rural communities
- To increase accessibility of isolated areas by providing all-weather roads
- To strengthen the capability of Kabupaten staff to plan, construct and maintain their road networks
- To introduce suitable techniques and work methods for the construction and maintenance of local roads.

1) The Republic of Indonesia is composed of 27 provinces, each of which has three to ten Kabupatens.

1.3 Project Scope

(i) Civil works to improve selected Kabupaten roads

(ii) Procurement of maintenance equipment

(iii) Consulting services for detailed design and civil works supervision, as well as for advisory and training activities

1.4 Borrower/Executing Agency

The Republic of Indonesia / Directorate General of Highways, Ministry of Public Works
Directorate General of Regional Development, Ministry of Home Affairs

1.5 Outline of Loan Agreement

Loan Amount Loan Disbursed Amount	12,882 million yen 11,891 million yen
Exchange of Note Loan Agreement	December 1987 December 1987
Terms and Conditions Interest Rate Repayment Period (Grace Period) Procurement	 3.0 % p.a. 30 years (10 years) General Untied (Partially Untied for Consulting Services)
Final Disbursement Date	December 1993

2. Results and Evaluation

2.1 Relevance

As shown in Repelita IV, the national five-year development plan from 1984 to 1988, the development of rural local roads was one of the most important issues in addressing rural development. The objective of this project, to improve selected local roads in 38 Kabupatens in 10 provinces as the second phase of Local Road Development Project, was consistent with the aforementioned national development policy, and is considered to have been relevant at the time of project appraisal. This project still conforms with the development policy and plan of the Republic of Indonesia. The current National Development Program, PROPENAS 2000-2004, points out the importance of transport infrastructure development, and lists maintenance of existing infrastructure as a priority program. Thus, the original objectives of the project continue to meet those of the country's development policy and plans.

2.2 Efficiency

(2.2.1) Project Scope

The original scope consisted of local road betterment extending 2,727 km, local road maintenance

of 21,962 km and procurement of maintenance equipment. The actual civil works were 2,374 km for road betterment and 6,036 km for road maintenance, reductions of 13% and 72%, respectively. The executing agency (Directorate General of Highways: DGH) mentioned two reasons for this revision. First there was the issue of design. Original designs for civil works were made one year before implementation, and, according to the executing agency, the original designs were unpractical because they were based on poor inventory data. Secondly, DGH was not fully capable of coordination with the related organizations or of implementation management of the project. Foreign and local consultants were employed for supervision duties. However, the project was formulated at the Kabupaten level, which may have caused the complications in project management. The original plan was revised or modified at the Kabupaten level without sufficient consultation with the Central Government.

All equipment was procured as originally planned.

(2.2.2) Implementation Schedule

While the project was originally scheduled for the period from January 1987 through March 1992, the actual implementation was undertaken from January 1988 to August 1991, ending seven months ahead of the schedule. The construction period for the betterment work lasted 36 months, as originally scheduled, while that for the maintenance work was reduced from the original 48 months to 36 months. The expedited schedule was a result of the significant reduction in maintenance work length, as mentioned above. Road construction equipment was delayed by one year, owing to coordination between the executing agency and each Kabupaten.

(2.2.3) Project Cost

The project cost estimate was 13,917 million yen at the time of project appraisal. The actual cost was 12,509 million yen, 10% less than the original estimate. The cost under-run is attributed to the reduction of project scope and an advantageous shift in the exchange rate. The rupiah drastically dropped against yen, from 0.094 yen/rupiah[1] in the year of appraisal in 1987 to 0.073 yen/rupiah[2] in the year of tender in 1988. Therefore, the actual disbursement from JBIC decreased, because the payments for civil works were made in rupiah.

2.3 Effectiveness

(2.3.1) Traffic Volume and Travel Speed

Traffic data were obtained from only one of the four Kabupatens, Kab. Gowa of South Sulawesi. Table 1 compares the expected traffic volume for 1998, forecasted at the time of project appraisal, and the actual traffic volume as recorded in 1998. Actual traffic volumes in 1998 exceeded the forecasted ones on most links, by 1.47 times on average. In the case of Kab. Gowa, traffic volume was forecasted to grow at 4.24% per annum, while the actual growth was 7.4% per annum. In the

[1] Used for projection by JBIC.
[2] Source: “International Financial Statistics”, IMF

1990s, the registration of motor vehicles increased significantly in Indonesia, at the rate of 8.9% per annum, and also in South Sulawesi, at a rate of 8.6%. Therefore, on most project links in 39 Kabupatens, actual traffic volumes are likely exceeding the forecasted volumes, suggesting that the project has been effective in facilitating transport activities in rural areas.

On local roads, vehicles can run at high speeds of, 60 to 80 km per hour, owing to low traffic volume, if the road is paved and in good condition. On a gravel road or paved road in bad condition, speed will be reduced to 20 to 30 km per hour. It will be further reduced to the range of 10 to 20 km per hour on dirt roads, which often become impassable in the rainy season. Taking into account the improvement of road conditions as a whole, discussed further in 2.5.1, project implementation should have led to an increase in average vehicle speed.

Table 1: Forecast and Actual Traffic Volume on Selected Links of Kab. Gowa

(Unit: PCU*/day)

Link	Section	Length (km)	1985	1998		Forecast Error
			(1) Actual	(2) Forecast	(3) Actual	(3)/(2)
1	Pabbangngiang - Pattallassang	12	230	395	365	0.92
2	Pattallassang - Paccellekang	3	83	141	239	1.70
5	Rappokaleleng - Pabbundukang	14	175	301	470	1.56
7	Rappodaang - Tanrorita	30	2	4	24	6.93
11	Sanrangang - Malakaji	39	4	6	76	13.80
12	Pattallassang - Pakkatto	7	95	162	247	1.52
19	Lanna - Peo	14	150	257	272	1.06
39	Kalukuang - Moncobalang	7	160	275	215	0.78
40	Moncobalang - Simpang Limbung	7	80	137	247	1.81
41	Boka - Pabbentengang	11	120	206	179	0.87
44	Doja - Ciniayo	6	75	128	211	1.65
45	Paccellekang - KMUP	7	65	111	273	2.46
58	Bontolangkasa - Jipang	14	75	128	310	2.42
	Average Traffic Volume	171	78	134	197	1.47

Note: (2) traffic volume forecast in 1987
(3) traffic volume estimated based on actual volumes in 1985 and 2001
n.a.: not available
Source: DPUK of Kabupaten Gowa
* PCU = passenger car unit

(2.3.2) Internal Rate of Return

In this project, road links designated for improvement were selected based on an EIRR over 10%. There were, however, several exceptions to that guideline, such as links selected for consistent network formation or for fulfillment of basic human needs. Thus, an economic evaluation of links was made at the stage of project road selection, but the criteria were not reported to the Kabupatens or provinces concerned.

Estimates of economic benefit in the 1996 JICA feasibility study measured only vehicle operating cost (VOC) savings, and excluded time savings, which is proportional to traffic volume (vehicle-km). In the 1990s, as Indonesia experienced rapid progress in the rate of motorization, the number of

vehicles increased 8.9% annually. Hence, a greater economic benefit would have accrued to most Kabupatens than originally expected. In this report, the EIRR was re-estimated only for selected provinces because of poor availability of traffic data. The only data available are those for the project length and cost by province. For the re-estimation, it was assumed that by implementing the project, road conditions would be improved from “poor” or “bad” to “fair” or “good”. In the case of Kab. Gowa, the actual traffic growth rate was equivalent to 85% of the vehicle increase rate. Applying this figure to the other Kabupatens, the EIRR was re-estimated by province, assuming that the EIRR is expressed by the average of those of corresponding Kabupatens where traffic data are available. Table 2 shows the re-estimation results in three provinces, ranging from 10.1% to 34.6%. It is difficult to compare the re-estimated EIRRs with the original. However the increase in the actual civil work per km suggests that the re-estimated figures may be lower than the originals.

Table 2: Re-estimation of EIRR of Local Road Development Project for Selected Provinces

Province	Estimated Traffic Growth (85 – 98) (% per year)	EIRR (%)	
		Original	Re-estimated
South Sulawesi	7.4	More than 10 %	10.1
Lampung	8.2	More than 10 %	30.8
South Sumatra	7.9	More than 10 %	34.6

2.4 Impact

(2.4.1) Economic Impacts

One of the main objectives of the Local Road Development Project is to develop the rural economy through provision of a better road network, which will reduce farm-to-market transport costs, increase farmer incomes and, thereby, encourage agricultural production. Table 3 compares rice production of 10 project provinces with that of others, since completion of the project. The project provinces in general show higher growth rates than others. This tendency implies that there is a correlation between the progress of this project and the increase of rice production in the last decade including the implementation period.

Table 3: Trend of Rice Production in Indonesia

Production (1000metric ton)

	1988	1990	1992	1994	1996	1998	1999
Project Province	7,859	8,625	9,802	9,719	11,418	10,350	11,061
Other Province out of Java	8,768	9,416	10,195	10,400	11,287	11,184	11,494
Java excl.Jakarta	25,050	27,138	28,243	26,523	28,397	27,703	27,848
Indonesia	41,676	45,179	48,240	46,642	51,102	49,237	50,402

Growth Rate (1988=100)

	1988	1990	1992	1994	1996	1998	1999
Project Provinces	100	110	125	124	145	132	141
Other Provinces out of Java	100	107	116	119	129	128	131
Java excluding Jakarta	100	108	113	106	113	111	111
Indonesia	100	108	116	112	123	118	121

Source: Statistical Yearbook Indonesia 1991, 1995 and 1999

(2.4.2) Impacts on Environment

This project did not include new road construction. It dealt with existing local road surfaces. Therefore, no negative environmental impacts were reported.

(2.4.3) Social Impacts

The local road development projects greatly improved accessibility between rural areas and urban areas. In the rainy season, bicycles, and often cars, could not use dirt roads, leaving rural areas relatively isolated. Pavement of these roads is estimated to have been one of the factors that solved the isolation problem, from the fact that there was an increase in the number of factories using materials from these rural areas. In the case of Kab. Pangkep in South Sulawesi, one masonry and two cement factories were established after the project was implemented, creating job opportunities for village people. Paved roads have also supported an expansion of bus service areas, providing rural people with greater convenience for commuting to urban areas, and for making trips to schools, hospitals, markets, and other destinations in the vicinity of the transport routes.

2.5 Sustainability

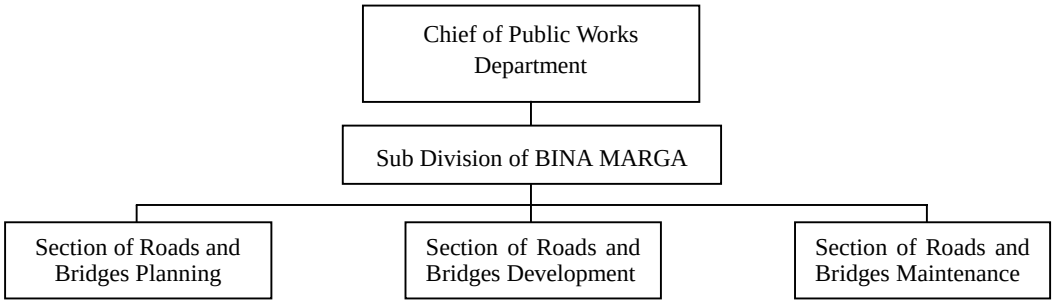
(2.5.1) Operation and Maintenance

a. Organization

The Provincial Department of Public Works (DPUP) is in charge of maintenance works for national and provincial roads, while the Kabupaten Department of Public Works (DPUK) is responsible for development and maintenance of Kabupaten roads, the DPUKs being mainly in charge of this project package. Maintenance equipment supplied to the Bina Marga for this project was passed on to the DPUKs, which rented it to contractors and operators. In order to support the DPUKs activities for implementation coordination, project units were established at the levels of the central government, the provincial governments and the Kabupatens, which were namely Project Management Unit (PMU), Project Coordinating Unit (PCU) and Project Unit (PU),

respectively. Owing to the decentralization policy, as denoted in PROPENAS (2000-2004), the central or provincial governments have been much less involved in developing local roads. The organization chart of each DPUK is shown as follows.

Figure 1: Organization Chart of Department of DPUK



b. Current Conditions

In this Study, four Kabupatens were selected for case studies including site visits. They were Kab. Musi Rawas and Kab. Musi Banyuasin of South Sumatra Province, and Kab. Gowa and Kab. Pangkep of South Sulawesi Province. Present road conditions in these Kabupatens are summarized in Table 4. It was difficult to identify which roads were improved as part of this project, since all the documents concerning the project have been lost. During 1987 and 2001, the Kabupaten road network was expanded significantly, by 2.5 to 3.8 times, in each Kabupaten, except in Kab. Pangkep which was expanded its roads only by 1.3 times.

Even in 2001, the ratio of asphalted road to total Kabupaten road length was not so high: ranging from 22% to 42% The rate was 82% in the exceptional case of Kab. Pangkep, located near the Provincial Capital of Ujung Pandang. More than 60% of gravel roads and dirt roads were in bad or very bad condition. Even so, the ratio of asphalt road length has increased significantly, when compared to pavement conditions at the time of project appraisal, ranging from 0% to 25%.

c. Institutional Capacity

It is quite difficult to identify which Kabupaten roads were implemented in this project, because project documents were stored neither in Central Government nor in local government offices.

Table 4: Situation of Kabupaten Roads in selected Kabupatens in 2001

Road Surface Type	Road Condition	South Sumatra		South Slawesi	
		Kab. Musi Rawas	Kab. Musi Banyuasin	Kab. Gowa	Kab. Pangkep
Asphalt	Good	194.4	176.7	66.7	232.8
	Fair	284.1	150.5		173.6
	Bad	134.9	76.6	177.3	36.5
	Very Bad	45.6	-	145.4	2.0
	Sub Total	659.0	403.8	389.4	444.9
Gravel/ Stone	Good	23.5	41.7	331.2	2.0
	Fair	144.2	-		17.0
	Bad	107.3	158.3		29.3
	Very Bad	146.0	40.3		10.5
	Sub Total	421.0	240.3	331.2	58.7
Earth	Good	5.0	102.1	983.9	0.0
	Fair	24.0	236.3		0.0
	Bad	181.5	310.3		29.6
	Very Bad	286.5	142.9		5.6
	Sub Total	497.0	791.6	983.9	35.2
Total in 2001		1577.0	1435.7	1704.5	538.8
Total in 1987		436.0	578.0	446.0	431.0
Growth Rate(01/87)		3.6	2.5	3.8	1.3
% of Asphalt to Total Length		41.8	28.1	22.8	82.6

Source: Each Kabupaten Department of Public Works (DPUK)

(2.5.2) Technical Capacity

As a result of the decentralization policy (Autonomi Daera), each DPUK became independently responsible for planning, construction, improvement and maintenance of Kabupaten roads. Along with this regional reform, personnel changes were made, in which officials and staff, including engineers, were transferred from the Provincial Governments to the DPUKs. However, since Provincial Governments themselves often did not have sufficient human resources to begin with, most DPUKs suffered a shortage of staff, and particularly in the area of technical capacity. For instance, there are 41 persons in the maintenance section of the DPUK of Kabupaten Pangkep in South Sulawesi. At first glance, the number seems large enough to maintain the Kabupaten road network, which totals 580 km in length. Yet Pangkep is reportedly suffering a shortage of engineers, mechanics and technicians, as well as of budget allocations and equipment. Pangkep DPUK has only one excavator and two graders, and does not have any spare parts or mechanical workshops. Thus, most maintenance work would have to be stopped if heavy mechanical equipment were out of order. Kab. Musi Banyuasin in South Sumatra is also running short of equipment.

As for Kabupaten roads, routine maintenance work, including grass cutting, asphalt patching, checking and cleaning of drains, is implemented by the DPUK itself, while periodic maintenance work,

including slope protection, overlay and drainage rehabilitation, is contracted out.

(2.5.3) Financial Status

The Kabupaten governments manage all budget and equipment matters concerning Kabupaten roads. There are two budgetary resources: the internal budget and the subsidiary budget provided by the Central/Provincial Government. As the latter is not sufficient in most cases, the decentralization policy will likely expand regional disparities between rich and poor Kabupatens. Table 5 shows standard budget allocations for local road maintenance and improvement in Kab. Gowa. In other Kabupatens, a similar standard is adopted. However, the actual budget, in each case, is far less than the estimate based on this standard.

Table 5: Standard Budget for Local Road Maintenance and Improvement

Works	Application	Standard Budget
Routine Maintenance	Sections with less than 20% bad conditioned road	Rp 7.5 million/km/yr
Periodic Maintenance	Sections with 20% - 60%bad conditioned road	Rp 45 million/km/3yr
Improvement	Sections with more than 60% bad conditioned road	Rp 125 – 400 million/km/5 yr

Source: Hearing at DPUK, Gowa

The actual budget in 2000 allocated for local roads was Rp 1,600 million in Kab. Pangkep, South Sulawesi, for a 538 km Kabupaten road; that is Rp 3.0 million per kilometer. Rp 8,330 million was allocated in Kab. Musi Banyuasin, South Sumatra, for a 1,435 km road: Rp 5.8 million per kilometer. Every Kabupaten is suffering from budget shortages and scarce equipment, materials and skilled labor.

3. Recommendations

Recommendation to the executing agencies at the central, provincial and Kabupaten levels:

Appropriate management system of operation and maintenance, and relevant budget support that enables it, should be established based on realistic road maintenance plans to be prepared by the provincial governments in well coordination with the Kabupaten governments. The central government, in particular, should designate a more effective and efficient way of budget allocation within the limited funding resource.

Comparison of Original and Actual Scope

Items	Plan		Actual	
(1) Project Scope 1.Civil works		unit: km		unit: km
Name of provinces	Betterment	Maintenance	Betterment	Maintenance
Riau	162.6	1,798.6	122.96	738.29
South Sumatra	348.7	3,229.0	229.72	1,012.44
Lampung	197.1	2,426.0	98.96	771.70
Central Kalimantan	175.6	1,233.1	212.92	238.54
East Kalimantan	415.0	1,477.3	150.20	827.49
South Kalimantan	522.2	3,919.6	511.81	632.30
East Nusa Tenggara	176.5	1,766.4	130.83	560.41
North Sulawesi	171.0	1,149.5	108.15	255.85
South Sulawesi	407.2	4,220.6	664.79	625.48
South-East Sulawesi	151.5	741.5	143.68	373.60
Total	2,727.4	21,961.6	2,374.02	6,036.10
2.Maintenance Equipments				
a) Motor Grader (75HP)	31 cars		31 cars	
b) Hand-guided Vib.Roller (1,000kg)	20 cars		20 cars	
c) Tire Roller (8-15 ton)	35 cars		35 cars	
d) Dump Truck (3.0 ton)	8 cars		8 cars	
e) Flat Bed Truck with Crane (3.0 ton)	40 cars		40 cars	
f) Flat Bed Truck (3.0 ton)	40 cars		40 cars	
3.Consulting Service for the above 1. and 2.				
(2) Implementation Schedule				
1.Consulting Services	October 1987- March 1990 (42 months)		44 months in total	
2.Civil works				
a) Betterment	April 1988- March 1991 (36 months)		Sept 1988- August 1991 (36 months)	
b) Maintenance	April 1988- March 1992 (48 months)		Sept 1988- August 1991 (36 months)	
3.Procurement of Equipment	January 1987- June 1987 (6 months)		January 1988- June 1988 (6 months)	
(3) Project Cost				
Foreign currency	9,018 million yen		7,963 million yen	
Local currency	4,899 million yen		4,546 million yen	
Total	13,917 million yen		12,509 million yen	
ODA Loan Portion	12,882 million yen		11,891 million yen	
Exchange Rate	1 rupiah = 0.094 yen (As of 1987)		1 rupiah = 0.070 yen (As of 1991)	

Independent Evaluator's Opinion on Local Road Development Project (II)

Raymond Atje

Senior Researcher, Department of Economics, CSIS, Jakarta

We second the report's assertion that the objectives of the program are still relevant. In fact, it could be argued that the development of rural local roads will become even more important as the government trying to provide remote areas with greater access to market, to various resources and public services.

The report states that the project resulted in positive economics and social impacts. The report argues that as a result of the project the growth rates rice production in the 10 project provinces are higher than in other provinces. This argument is not very convincing, however, as there are other factors that might have contributed to higher growth of rice production than improvement in the road conditions. It might be the case that more land had been converted to rice field, or that farmers had used better method to produce rice. Otherwise, the surveyor can come up with a more rigorous quantitative analysis such a regression analysis to establish the relationship between an increase productivity and road condition. Alternatively, we proposed to use several other indicators to reflect the economic benefit of the projects, among other are:

- the cost of transportation to measure the economic impact of the project
- time saved due to the project: does it take shorter time to reach certain points

Indirect economic (job creation, increased presence of factories) impact and social impacts is nicely outlined in the survey result. However, once again, the surveyor could not come up with rigorous quantitative analysis to back up his arguments. During the field survey the surveyor could have asked stakeholders, such as local communities, about the impacts of the project on their daily life.

On the sustainability, the report considers three factors, i.e., operation and maintenance, technical capacity, and financial status. The report correctly points out that as a result of the decentralization program, the Public Work Unit at the kabupaten level (DPUK) will be responsible for development and maintenance of kabupaten roads. However, it is hard to draw a conclusion from the report whether or not the surveyed kabupatens will be able to sustain the operation and maintenance of local roads. On the institutional capacity (section 2.5.1c), we expect a report on the capacity of local institution (e.g., DPUK) to undertake the operation and maintenance jobs rather than a report on the missing documents. The report does mention that those kabupatens suffer from shortages in engineers, mechanics, technicians, as well as from lack of financial resources. It does not elaborate, however, to what extent these shortages will affect the sustainability of the project.

Note: I have benefited from discussions with Ms Titik Anas, research staff, CSIS, who has been kind enough to provide some insightful comments about the report. The usual disclaimer applied.